Cornerstone Engineering, Inc.
Consulting Engineers and Land Surveyors

Delano-Alpaugh Water Reclamation Project

Department of Water Resources
Urban Water Conservation Grant

2505 “M” Street • Bakersfield, CA 93301 • (661)325-9474
www.cornerstoneeng.com

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Consolidated Water Use Efficiency 2002 PSP
Proposal Part One:

A. Project Information Form

1. Applying for (select one):	☒ (a) Prop 13 Urban Water Conservation Capital Outlay Grant ☐ (b) Prop 13 Agricultural Water Conservation Capital Outlay Feasibility Study Grant ☐ (c) DWR Water Use Efficiency Project	
2. Principal applicant (Organization or affiliation):	City of Delano	
3. Project Title:	Delano-Alpaugh Water Reclamation Project	
4. Person authorized to sign and submit proposal:	Name, title	Adela Gonzalez, City Manager
	Mailing address	P.O. Box 939 Delano, CA 93216
	Telephone	(661) 721-3303
	Fax.	(661) 721-3312
	E-mail	gonzalez@ci.delano.ca.us
5. Contact person (if different):	Name, title.	Mark Dawson, Civil Engineer
	Mailing address.	2505 "M" St. Bakersfield, CA 93301
	Telephone	661-325-9474
	Fax.	661-322-0129
	E-mail	mkd@cornerstoneeng.com
6. Funds requested (dollar amount):		$4,999,862
7. Applicant funds pledged (dollar amount):		$0
8. Total project costs (dollar amount):		$4,999,862

9. Estimated total quantifiable project benefits (dollar amount):	$7,033,000
Percentage of benefit to be accrued by applicant:	100 %
Percentage of benefit to be accrued by CALFED or others:	0%

Consolidated Water Use Efficiency 2002 PSP
Proposal Part One:

A. Project Information Form (Continued)

10. Estimated annual amount of water to be saved (acre-feet):	6,195 acre feet
Estimated total amount of water to be saved (acre-feet):	154,875 acre feet
Over 25 years	25 years
Estimated benefits to be realized in terms of water quality, instream flow, other:	$0
11. Duration of project (month/year to month/year):	October '02 –October '03
12. State Assembly District where the project is to be conducted:	30th Dean Florez
13. State Senate District where the project is to be conducted:	16th Jim Costa
14. Congressional District(s) where the project is to be conducted:	20th Cal Dooley
15. County where the project is to be conducted:	Kern County, Tulare County
16. Date most recent Urban Water Management Plan submitted to the Department of Water Resources:	Submitted December 3, 2001

17. Type of applicant (select one):
Prop 13 Urban Grants and Prop 13 Agricultural Feasibility Study Grants:

- ☒ (a) city
- ☐ (b) county
- ☐ (c) city and county
- ☐ (d) joint power authority
- ☐ (e) other political subdivision of the State, including public water district
- ☐ (f) incorporated mutual water company

DWR WUE Projects: the above entities (a) through (f) or:

- ☐ (g) investor-owned utility
- ☐ (h) non-profit organization
- ☐ (i) tribe
- ☐ (j) university
- ☐ (k) state agency
- ☐ (l) federal agency

18. Project focus:

- ☐ (a) agricultural
- ☒ (b) urban

Consolidated Water Use Efficiency 2002 PSP
Proposal Part One:

A. Project Information Form (continued)

19. Project type (select one):
Prop 13 Urban Grant or Prop 13 Agricultural Feasibility Study Grant capital outlay project related to:

- ☐ (a) implementation of Urban Best Management Practices
- ☐ (b) implementation of Agricultural Efficient Water Management Practices
- ☐ (c) implementation of Quantifiable Objectives (include QO number(s)

.....

- ☒ (d) other (specify)

Reclaimed Water Conveyance System

DWR WUE Project related to:

- ☐ (e) implementation of Urban Best Management Practices
- ☐ (f) implementation of Agricultural Efficient Water Management Practices
- ☐ (g) implementation of Quantifiable Objectives (include QO number(s))
- ☐ (h) innovative projects (initial investigation of new technologies, methodologies, approaches, or institutional frameworks)
- ☐ (i) research or pilot projects
- ☐ (j) education or public information programs
- ☐ (k) other (specify)

.....

20. Do the actions in this proposal involve physical changes in land use, or potential future changes in land use?

- ☐ (a) yes
- ☒ (b) no

If yes, the applicant must complete the CALFED PSP Land Use Checklist found at http://calfed.water.ca.gov/environmental_docs.html and submit it with the proposal.

Consolidated Water Use Efficiency 2002 PSP
Proposal Part One

B. Signature Page

By signing below, the official declares the following:

The truthfulness of all representations in the proposal;

The individual signing the form is authorized to submit the proposal on behalf of the applicant; and

The individual signing the form read and understood the conflict of interest and confidentiality section and waives any and all rights to privacy and confidentiality of the proposal on behalf of the applicant.

_____	_____	_____
Signature	Name and title	Date

Consolidated Water Use Efficiency 2002 PSP

Proposal Part Two

Project Summary

Water is a resource that many Californians take for granted. Yet, the effective management of this valuable commodity is essential for future prosperity. This is particularly true in light of the many challenges facing the water industry today -- skyrocketing demands, dwindling supplies, limited water banks, increased use for environmental purposes, and the ever-increasing cost of power. Efforts to maximize the use of available water supplies through programs involving recycling and reclamation will undoubtedly become a necessary standard in the years to come. The project proposed under this application is a prime example of good water management. It clearly provides far-reaching regional benefits and aptly meets the goals of the Department of Water Resources (DWR) Water Use Efficiency program.

Located at the west end of the Kern-Tulare County line, the Delano-Alpaugh Water Reclamation Project involves the design and construction of a wastewater conveyance system between the City of Delano and the Alpaugh Irrigation District (AID). The system will move treated wastewater from the City of Delano approximately 11 miles northwest. Upon reaching AID's existing storage reservoirs, the water would then be diluted and distributed for irrigation onto crops that are not directly consumed by humans, such as cotton, alfalfa and certain grains.

The City of Delano is in the process of expanding its wastewater treatment facilities to meet the needs of its growing population. Currently, this expansion requires the acquisition of prime agricultural land for the construction of basins to store Delano's treated wastewater until it percolates, evaporates, or can be given away to local farmers growing non-edible crops. The amount of wastewater generated by the City is projected to reach 6.66 MGD by the year 2020. This project directly benefits the City of Delano by reducing expansion costs and providing long-term disposal of treated wastewater. Local

benefits also include the preservation of farmlands and revenue in the form of agriculture, jobs, and property taxes.

The farming community of Alpaugh also will benefit from this project. For AID, the need for a dependable, low-cost source of water is critical. The energy crisis has nearly put AID out of business. This project allows them to turn off groundwater pumps. As a community built on agriculture, the sustainability of this commodity is critical. Without a reasonably priced irrigation water supply, the future of Alpaugh is uncertain. This project will significantly reduce AID's demand for groundwater, as well as the power consumption necessary to collect the groundwater. It will provide the farms of Alpaugh with an inexpensive and consistent supply of water. Once operational, the system will benefit AID and the City of Delano for many years to come.

Through an innovative and relatively inexpensive solution, the City of Delano and AID are undertaking a project that has big potential. It is only through the cooperative efforts of the applicable municipalities, governing agencies, and funding sources that this project will become a reality. Such strategic water management will serve as an excellent example for other agencies in California.

A. Scope of Work: Relevance and Importance

A.1. The use of treated wastewater for irrigation is a prime example of the methods California must adopt to conserve water and preserve its agricultural industry. In a letter addressed to the State Senate on October 7, 2001, Governor Gray Davis wrote, "*I am re-emphasizing the need to aggressively pursue infrastructure projects throughout California . . . and continued investment in projects that conjunctively use surface and groundwater supplies*." The Delano-Alpaugh Water Reclamation Project meets the objectives of California's water conservation policy.

The overall scope of this project is to design and build a mutually beneficial wastewater conveyance system. This system will relieve Delano of the burden of storing treated

wastewater and provide AID with a sustainable source of water that will significantly decrease their energy demand. In doing so, the agricultural land of Alpaugh will be preserved and the community will sustain its agricultural industry. This will ultimately assist in preserving the integrity of the land and the regional watershed.

In a region of California that receives only six inches of rain annually, and depends on groundwater collection to support its agricultural industry, this project is an excellent example of sustainable water management. With this project in place, collected groundwater is used twice: once by the residents of Delano and again by the farmers of Alpaugh. This project maximizes the benefits of groundwater and reduces the drain on the aquifer. Projects like this reduce groundwater depletion in the southern central valley, making more groundwater available to support the Bay-Delta water supply and increase aquatic habitats. By reducing groundwater pumping, the project also directly reduces energy demands. Any reduction in energy consumption, especially one with broad impact, ultimately reduces pollution and strengthens California's energy situation.

A.2. Delano and Alpaugh are located in the South Valley Floor watershed, as defined by the CALFED Watershed program, in the southern San Joaquin valley. This region is primarily used for agriculture and relies heavily on groundwater for irrigation. As the population continues grow, the competition for water between the agricultural industry and residential development will increase. Continued dependence on groundwater for agriculture increases the risk of groundwater overdraft.

The Alpaugh Irrigation District sits above two levels of groundwater. The groundwater six feet below the surface is held in place by a layer of Corcoran clay soil, which creates a perched water table. The clay will not allow this groundwater to seep to the layer below. This water is brackish and unsuitable for drinking or irrigation. Below the Corcoran clay soil lies the second level of groundwater. This aquifer is recharged by groundwater flowing from areas east of Alpaugh, including Delano. It is suitable for both drinking water and irrigation. However, it lies deep beneath the surface and accessing

this water requires deep wells and powerful pumps. Both Delano and Alpaugh acquire their potable and irrigation water from this source.

Like the rest of California, AID has felt the impact of soaring power costs in the last year. As an irrigation district that relies almost exclusively on groundwater supplies, AID is at the mercy of 17 electric motors that drive its deep well pumps. The exorbitant cost of operating these motors severely threatens their ability to supply water at a reasonable rate. This, in turn, has a direct affect on the region's ability to sustain agricultural production. The desperate nature of the situation is illustrated in an excerpt from a recent article published in the Fresno Bee as follows:

> *A cautionary tale for Valley water districts is unfolding in southwestern Tulare County, where Alpaugh Irrigation District brushes against bankruptcy.*
>
> *Alpaugh Irrigation's dilemma – an unpaid electricity bill totaling more than $330,000 – stems from a tardy response to the state's energy crisis. The district didn't increase prices quickly enough to meet the rising cost of delivering water.*
>
> *To pay the bill, Alpaugh Irrigation is slashing its overhead, exploring cheaper sources of water and seeking utility and public approval to increase fees.*
>
> *A failure to settle the debt leaves families and farms vulnerable to a shutdown of the electric-powered water pumps.*
>
> *Experts say similar difficulties could arise elsewhere…*[1]

The AID Board of Directors believes it is essential to seek an alternative to the sole use of groundwater for irrigation. The livelihood of an entire community, which was built on agriculture, is at stake.

The City of Delano, located about 15 miles southeast of Alpaugh, is currently in the planning stages of a project to expand their wastewater treatment facilities and treated effluent storage reservoirs. This project is being undertaken as a necessary response to the

[1] Obra, Joan. "As goes Alpaugh Irrigation District, so may others go." *The Fresno Bee*. 16 January 2002: B1+.

City's rate of growth. In order to accommodate the area of the new storage reservoirs, the City is considering the purchase of prime farmland. The vast majority of the water is either given to nearby farmers for irrigation or is pumped into the storage reservoirs where it eventually percolates into the ground or evaporates. The costs associated with this practice are significant. Land purchases, construction of the facilities, operation and maintenance of the facilities, loss of farming-related jobs, and resulting lost property tax revenue make this situation less desirable. Since irrigation with treated effluent is restricted to crops not intended for human consumption, Delano's ability to give the water away to nearby farmers is limited. The farmland surrounding the city, once planted with alfalfa and cotton, is gradually converting to more permanent food crops such as grapes and orchards. Storing treated wastewater is a necessary burden . . . unless someone creates a demand for the water.

Moving treated wastewater from Delano to Alpaugh is a logical solution to both of the communities' problems in light of the following:

1. Alpaugh is located approximately 60 feet lower in elevation than Delano.
2. The types of crops grown in the Alpaugh area are not directly consumed by humans.
3. The total demand for water by AID users far exceeds the current amount of wastewater generated by Delano; this will be the case well into the foreseeable future.
4. With all irrigation operations idle, AID's existing reservoirs can store at least 200 days of Delano's current rate of maximum wastewater generation.
5. Delano wants to dispose of the water.
6. AID wants the water.

According to Delano's 2001 Draft Urban Water Management Plan, the City recognizes the benefits of discharging treated wastewater to farmers. However, the growing population of the community will, in the future, occupy the land that is now used for agriculture. Thus, the ability of the City to dispose of treated wastewater to nearby farmers will be limited. This project will meet the goals of Delano's Draft Urban Water

Management Plan by conveying all the wastewater that the community can produce to Alpaugh. Should available farmland in Delano decline, AID will remain a stable recipient.

AID's Water Conservation Plan addresses the District's need to conserve groundwater. The District does not anticipate significant residential growth or a voluntary reduction in agricultural production. The need for reasonably priced irrigation water will either remain constant or increase in the future. With very limited surface water supplies available to them, this creates a dilemma for the District. The proposed project would meet the goals of the District's Water Conservation Plan by allowing them to reduce their dependence on groundwater.

Currently, AID provides 13,215 acre-feet per year of water to farms in the District. Wastewater from Delano could currently supply 5,998 acre-feet per year, thereby reducing AID's groundwater pumping by more than a third. By requiring less groundwater pumping, the threat of aquifer overdraft is reduced. Thus, beyond meeting local water management objectives, this project is beneficial on a regional level as well.

B. Scope of Work: Technical/Scientific Merit, Feasibility, Monitoring and Assessment

1. Methods, procedures, and facilities

The proposed reclaimed wastewater line will connect the Delano Waste Treatment Facility located at the north end of Lytle Avenue, in the City of Delano to the Alpaugh Irrigation District's (AID) Reservoir No.2 located at the northwest corner of the intersection of State Route 43 (SR43) and Avenue 56. Please refer to the attached preliminary plans.

The pipeline proposed is a gravity line. The design criteria used in the sizing of the proposed wastewater reclamation line system was taken from the Wastewater Facilities Expansion Project Study by Carollo Engineering for the City of Delano dated August

2001. Hydraulic capacities of the plant facilities are based upon Peak Hour Flows (PHF). The PHF is approximately two times the Average Annual Wastewater Flow (AAWF). The Average Day Maximum Month Flow (ADMMF) was used to determine the adequacy of AID's reservoir capacity to accommodate the treated effluent. The year 2020 projected flows from the plant are as follows:

- AAWF = 6.66 million gallons per day (MGD)
- ADMMF = 8.0 MGD
- PHF = 13.3 MGD

Two points of connection are proposed at the existing treatment plant. The primary connection is at the effluent pumping station located in the central portion of the facility. At this location a 36” diameter high-density polyethylene (HDPE) pipe will tie-in directly to the pump intake structure. There are 4 existing pumps in this facility with a fifth one planned to meet the needs of the community through the year 2020. Each pump is rated at 3800 gallons per minute (gpm) at 25 feet of head. The pumps send the treated effluent through an existing 36" plant discharge line to four existing unlined storage ponds and two existing lined storage ponds to the east of the plant. The proposed 36" HDPE line at this location is sized to accommodate the average flow or approximately one half of the combined effluent pump capacity of 19,000 gpm. This amounts to about 21.5 cubic feet per second (cfs). A 36" butterfly valve is proposed where the wastewater line ties in to the pump structure for required maintenance on the line.

The second point of connection is intended to allow discharge of the peak flows into the proposed wastewater line. The peak flows will continue to be pumped into the storage ponds only temporarily. An 18" control valve system is proposed along the existing 36" diameter plant discharge line. An 18" diameter gravity PVC pipe is proposed from this junction, downstream, to the proposed 36" wastewater line. During peak wastewater periods of the plant, the 18" valve will be closed to prevent excessive pressure on the proposed 36" wastewater line. When flows return to lower levels, the valve opens, thus emptying the storage ponds. Flow level telemetry between the effluent pump station and

the 18" valve will automate this operation. An 18" butterfly valve is proposed for required maintenance on the line.

The proposed 36" HDPE wastewater pipe gravity flows west of the plant to the east side of Section 7 and then north to Cecil Avenue. HDPE was selected because of its economy compared to other materials such as reinforced concrete pipe. It has a superior Manning "n" value i.e. 0.010 compared to 0.013 for concrete. The flow efficiency is therefore much better. 600-foot manhole spacing is proposed along the planned route for maintenance purposes. The pipe flowline slope is very gradual but a minimum slope of 0.100% was maintained in the design to achieve minimum cleansing velocities.

Cecil Avenue is a relatively newer road. It was reconstructed about 10 years ago with the Delano I Prison facility on the north side of Cecil Avenue. It is a two-lane pavement with 4 feet paved shoulders. In the project limits, a 2-foot drainage v-ditch runs parallel to the roadway approximately 27 feet on each side of the centerline of the road. The proposed pipeline extends north under Cecil Avenue to the north shoulder of Cecil Avenue and continues west. Kern County policy requires boring for utilities crossing asphalt concrete roadways. A 36" RCP bore and jacking is therefore proposed at this location. The pipeline alignment is proposed on the north side of Cecil Avenue to minimize disruption to the residences on the south side of the road near SR43 and to avoid utility poles on the alignment. The alignment is proposed at 26 feet north of the centerline of Cecil Avenue to stay clear of existing pavement and remain within the existing road right-of-way, which is 60 feet along this corridor.

The proposed wastewater line extends to the west along the north shoulder of Cecil Avenue. Various existing culverts, fencing and other obstructions are anticipated along the route. They will require removal and replacement to accommodate the construction of the wastewater line.

A 5,080-inmate prison (Delano II) is proposed at the intersection of Wasco Pond Road and Cecil Avenue. The Facilities Management Division of the State of California has

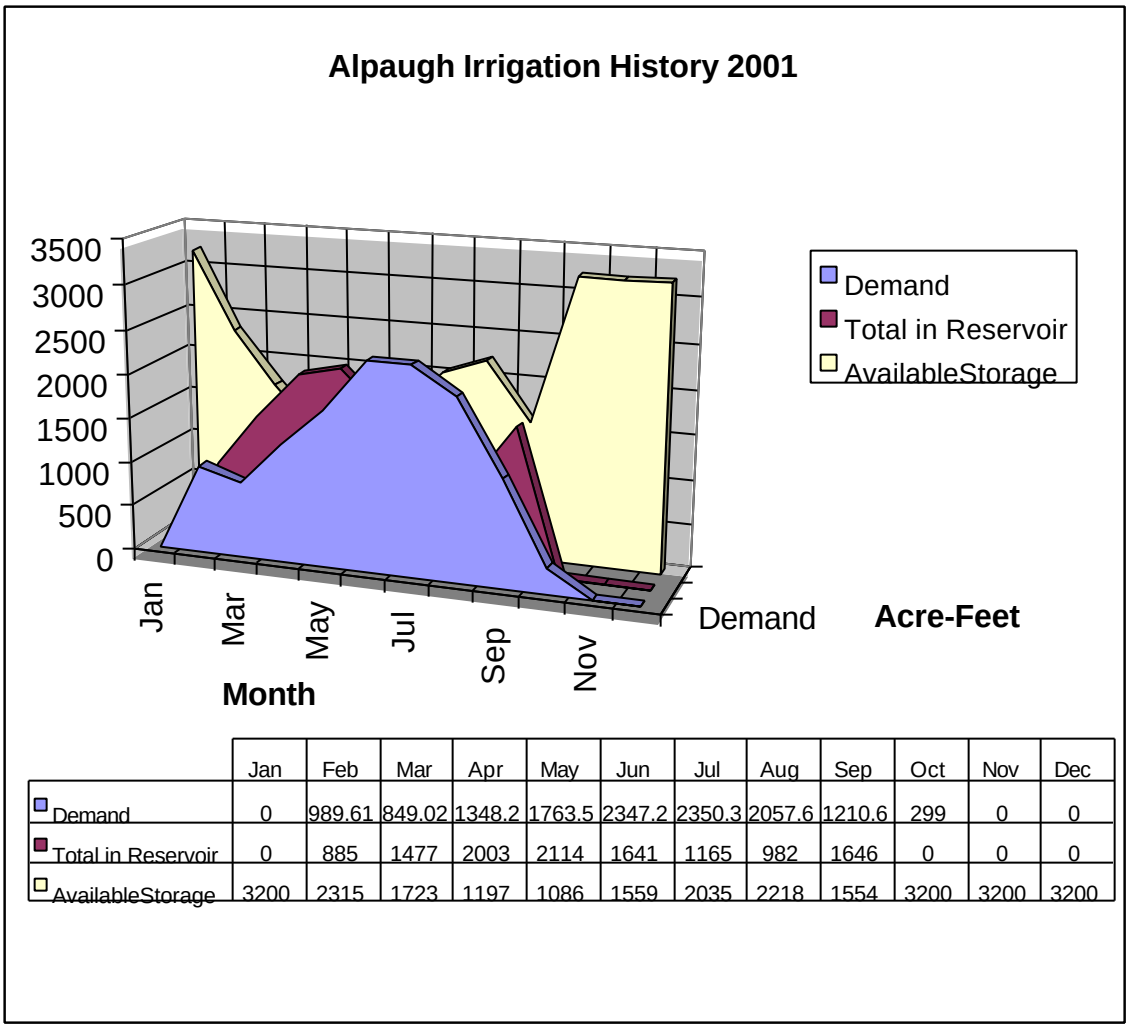
expressed an interest in discharging treated wastewater from their proposed Delano II prison project. A private secondary treated wastewater treatment facility is planned by the State to serve the prison. This would add an additional 0.77 MGD from the proposed facility. Half of the peak hour flow from this facility is estimated to be 2.5 cfs. The prison's planned waste treatment facility effluent disposal ponds would remain and handle peak flows similar to the City of Delano's system.

The 36" HDPE pipeline extends west from the future Delano II prison along the north side of Cecil Avenue to SR43. At this location, the pipe is planned to be bored and jacked under the highway and extend north along the west shoulder. SR43 is a two-lane pavement with 4 feet paved shoulders. The alignment is proposed at 10 feet east of the west right-of-way line of SR43 to stay clear of existing pavement, stay out of the railroad property and remain within the existing state right-of-way which varies between 80 feet and 100 feet along this corridor.

At the intersection of Avenue 56, the 36" diameter wastewater line continues to about 300 feet north of the intersection to an angle point manhole where the pipe changes direction and extends toward the southeast corner of AID's Reservoir No. 2. At this location, the proposed pipe will be bored and jacked under the Atchison Topeka and Santa Fe Railroad tracks (Currently the Burlington Northern Santa Fe Railway) and extend westerly to a proposed pump lift station. The pump lift station will consist of three (3) 4,000-gpm vertical turbine pumps. One of the pumps will be fitted with a Variable Frequency Drive (VFD) unit to increase the efficiency of the lift station and control power usage and associated energy costs during lower flow periods from the waste treatment plants. From the lift station, the wastewater will be discharged into the reservoir through a concrete inlet structure. Rock slope protection is proposed along the inlet to prevent erosion.

Reservoir No. 2 is surrounded by an 8-foot levee with 8:1 side slopes. Assuming 2 feet of freeboard, it has a capacity of approximately 2,400 acre-feet. AID has two other reservoirs located approximately 1/2 mile north of Reservoir No.1. With the three

reservoirs half full, the combined capacity is approximately 3,200 acre-feet. It is possible to move water from one reservoir to the other through existing AID conveyance facilities. An analysis of AID's irrigation demand for 2001 was conducted to determine the adequacy of AID to receive the treated effluent from Delano. Using the Average Day Maximum Month Flow (ADMMF) of 8.0 MGD from the City of Delano and the estimated 0.77 MGD from Delano II prison, the design monthly discharge to AID is approximately 830 acre-feet. As shown on Figure 1, the 1,086 acre-feet minimum monthly available storage far exceeds the design flow. Even during the months of October through January, when irrigation is minimal, AID will manage the system to provide the necessary storage capacity in their reservoirs to provide ample space for receiving the wastewater. No storage capacity problems are anticipated.



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Demand	0	989.61	849.02	1348.2	1763.5	2347.2	2350.3	2057.6	1210.6	299	0	0
Total in Reservoir	0	885	1477	2003	2114	1641	1165	982	1646	0	0	0
AvailableStorage	3200	2315	1723	1197	1086	1559	2035	2218	1554	3200	3200	3200

Figure 1

2. Task List and Schedule

The anticipated time schedule for this project is estimated as follows. Work will commence immediately upon receiving a notice to proceed from DWR. Items marked with an asterisk (*) are beyond the reasonable control (i.e. unresponsiveness of utility agencies, environmental delays, inclement weather during construction, etc.) of the engineer and are provided as rough estimates only.

[TASK No.] TASK	EST. BEGIN	EST. DURATION	EST. COMPLETE
A. Environmental	October 1, 2002	8 weeks	December 2, 2002
B. Design	October 1, 2002	18 weeks	February 3, 2003
C. Governing Agency Review/Permits	January 2, 2003	4 weeks*	February 3, 2003
D. Utility Coordination / Agency Review	December 2, 2002	8 weeks*	February 3, 2003
E. Contract Administration / Bidding / Award	February 4, 2003	8 weeks	April 1, 2003
F. Construction	April 2, 2003	26 weeks*	October 1, 2003
	TOTAL	1 year	

If a portion of the project is funded, the following tasks are considered inseparable or should be grouped as follows:

- Task A
- Task B, C, D
- Task E, F

Task A. Environmental - Upon notice to proceed, the environmental phase will be initiated. An initial study will be conducted, including biological and archeological research and reports to determine the proper CEQA action for this project. Due to the fact the project is located entirely within existing developed road right-of-way or City of Delano facilities or AID facilities, and the project is an extension of an existing City facility, it is expected that the project will be classified categorically exempt. The result of this task is an environmental clearance from the local governing agency.

Task B. Design Phase – A records research will be done through the local and state agencies to ascertain survey control for the proposed project for the purpose of defining the proper alignment for the proposed wastewater reclamation line and to ensure it is constructed in the existing right-of-way. A field survey will be necessary to establish control and determine existing topography and terrain. Plans and specifications will then be prepared. The result of this task is the completion of project plans and specifications.

Task C. Governing Agency Review/Permits – Plans and specifications will be coordinated through the local and state governing authorities for approval. Revisions to the plans and specifications will be made as necessary. The result of this task is a final set of project plans and specifications

Task D. Utility Coordination – A utility search will be made to determine utility organizations with facilities near the project. Plans and specifications will be coordinated through the applicable utility organizations to determine the locations of conflicting utilities. Plans and specifications will be revised as necessary to clear any major conflicts or incorporate design items for utility or existing facility repairs or replacement.

Task E. Contract Administration / Bidding / Award – Final project plans and specifications will be advertised for competitive contract bidding. Bids will be analyzed and the lowest responsive bidder will be selected to construct the project. The result of this task is the award of the contract.

Task F. Construction – After the contract is awarded, construction of the proposed facility will begin. Construction inspection of the work is necessary to ensure compliance with approved plans and specifications. Daily inspection reports, materials testing, construction staking and progress payment coordination will be performed. The result of this task is the installation of the proposed treated wastewater pipeline in conformance with plans and specifications. Assuming an October 1, 2002 project start-up date, the water reclamation line is estimated to be online and operational by October 1, 2003.

3. Monitoring and Assessment

Goal 1. – Reduce groundwater depletion.

Monitoring and Assessment Program

- Collect data from existing agricultural and domestic wells. Compare after project groundwater pumping requirements for District with pumping requirements prior to project.

- Data to be stored in electronic format at the District and City offices. Report information made available to public via the internet.

Performance Measures

- Groundwater levels in the District should begin to rise after project completion. Actual level increase, because of hydrologic variables, cannot be predicted. In general, overall District water level increases, however small, are positive and indicate goal success.

Goal 2 – Reduce power consumption

Monitoring and Assessment Program

- Collect data and compare overall after project power consumption by Alpaugh Irrigation District wells and City of Delano Treatment Facility with power requirements prior to project.
  Data to be stored in electronic format at the District and City offices. Report information made available to public via the internet.

Performance Measures

- Reductions in District electrical consumption are expected to be in the 47% range. Power consumption decreases in excess of 25% would be considered successful for this goal.

Goal 3 - Reduce the conversion of prime agricultural lands.

Monitoring and Assessment Program

- Verify that additional agricultural lands have not been needed by the City of Delano on which to spread wastewater.
- Data to be stored in electronic format at the District and City offices. Report information made available to public via the internet.

Performance Measures

- The proposed project should diminish, for the next 25 years, the acquisition of lands by the City of Delano for the disposal and spreading of wastewater.

Goal 4 – Secure existing agricultural enterprise and increase agricultural production the Alpaugh district.

Monitoring and Assessment Program

- Collect data and monitor the total acreage of post project active farmland with that prior to project.
- Data to be stored in electronic format at the District and City offices. Report information made available to public via the internet.

Performance Measures

- Project success should produce and increase in active agricultural land utilization.
- An increase of 10% would indicate project goal success.

4. Preliminary Plans and Specifications and Certification Statement

Refer to the attached preliminary plans and certification statement at the end of the application. The California Standard Specifications, current edition, will be used in the construction contract.

C. Qualifications of the Applicants

The success of the Delano-Alpaugh Water Reclamation Project will require the combined cooperative efforts of several entities. These entities have given their support for the project and are prepared to do their part in seeing it through to completion. They are listed and described as follows:

City of Delano - Delano is the second largest incorporated community in Kern County, with a population of over 35,000. The City of Delano owns and operates the wastewater treatment facility that serves the community. As applicant for the project, the City will be involved in providing current and projected treatment data that will be used in designing the proposed pipeline to AID. The City will also assist in coordinating with the Regional Water Quality Control Board. Ultimately, the City will enter into an agreement with AID for the delivery of treated effluent via the proposed conveyance system.

Alpaugh Irrigation District (AID) - Alpaugh Irrigation District, located in Tulare County, has served Alpaugh farmers since 1915. Steve Martin has served as the president of the Board of Directors for over a decade and is actively involved in this project. AID will be responsible for receiving, storing, and delivering all water transported as a result of this project. AID will assume ownership, operation, and maintenance of the new system.

Southern San Joaquin Municipal Utility District (SSJMUD) – SSJMUD provides irrigation water to farmers in the Delano area from the Friant-Kern Canal. District staff has been instrumental in assisting AID's pursuit of this project and will continue to offer their full support. SSJMUD's interest in this project lies in the fact that its water allocation quantities are threatened by Delano's current practice of providing treated wastewater to local farmers. In the future, the maintenance of these allocations will be critical for Delano, as SSJMUD's water may serve as a source of domestic water for the City in the future.

Cornerstone Engineering Inc. (CEI) – CEI, a civil engineering firm headquartered in Bakersfield, has been retained to manage the overall project effort. The consulting and design experience of Cornerstone Engineering spans over 23 years. The staff consists of a variety of skilled professionals who are qualified to work on the various tasks required by the Project.

Mark Dawson has been assigned to manage the overall project effort. He is a licensed Civil Engineer in the State of California, and has over 15 years of experience with public works improvement projects. Please refer to the attached resume in Appendix A. Also included is the resume of Mike Callagy and A. J. Whitaker, who will also be directly involved in the managing, coordination and design efforts for this project.

D. Benefits and Costs

1. Budget Breakdown and Justification

The cost breakdown for the various tasks of the project as stated in Section B-2 is as follows:

Preliminary Engineer's Estimate

Description [Task No.]	Unit	Quantity	Price	Cost
Mobilization	LS	1	$ 40,000	$ 40,000
18" Polyvinyl Chloride Pipe SDR35	LF	3,004	$ 23.50	$ 70,594
18" Control Valve System/Enclosure	LS	1	$ 40,000	$ 40,000
36" HDPE Pipe	LF	62,082	$ 52.50	$ 3,259,305
36" RCP (Boring and Jacking)	LF	222	$ 500	$ 111,000
18" Butterfly Valve	EA	1	$ 3,500	$ 3,500
36" Butterfly Valve	EA	1	$ 12,000	$ 12,000
Manhole	EA	117	$ 2,000	$ 234,000
Pump Station	EA	1	$ 200,000	$ 200,000
Reservoir Inlet Structure	EA	1	$ 15,000	$ 15,000
Rip Rap Rock Slope Protection	CY	45	$ 60	$ 2,700
Miscellaneous Existing Facility Repair	LS	1	$ 50,000	$ 50,000
All items of work inseparable [F]				
			TOTAL CONSTRUCTION COST:	$ 4,038,099
Miscellaneous [Task No.]				
Contingency (10%) [A – F]	LS	1	$ 403,810	$ 403,810
Design Engineering (5%) [B, C, D]	LS	1	$ 201,905	$ 201,905
Construction Engineering (Inspection,testing,staking - 8%) [E, F]	LS	1	$ 323,048	$ 323,048
Biota Report [A]	LS	1	$ 6,000	$ 6,000
Archaeology Report 1 Report [A]	LS	1	$ 6,000	$ 6,000
Geotechnical Report [B]	LS	1	$ 11,000	$ 11,000
Agency Fees/Permits [F]	LS	1	$ 10,000	$ 10,000
			TOTAL MISCELLANEOUS COST:	$ 961,763
			GRAND TOTAL:	$ 4,999,862

All project costs are shown in the above preliminary engineer's estimate. The tasks and justifications are fully described in Section B.2.

Since the project is located entirely within existing developed road right-of-way or City of Delano facilities or AID facilities, no land purchases or easement acquisitions are anticipated. The above construction costs are installed costs and include materials and labor and all costs to complete the item. Permits will be required from Caltrans, B.N and S.F Railroad, Tulare County, Kern County, City of Delano and other possible local, state, and federal governing authorities. The estimated project contingencies are industry standard for public works design and construction projects. They account for unforeseen items of work as may be discovered in the field during construction necessary to complete the construction of the project of the project.

D.2. Cost Sharing

The Water Use Efficiency Program, for which this application package was prepared, was identified early in the funding research phase as the ideal source of funding for projects of this nature. Applications for other funding programs are currently being reviewed or applied for but no monies have been secured at this time. These programs are described as follows.

The California Energy Commission offers the Agricultural Peak Load reduction program which awards money based on a reduction of energy usage. Applications are accepted after the energy reduction program is in place and can demonstrate a substantial decrease in usage. Preliminary estimates indicate this project would qualify for a grant in the amount of approximately $184,000 under this program.

The Economic Development Assistance Program, administered by the U.S. Department of Commerce, was developed for communities demonstrating economic distress. Applications are accepted on an ongoing basis, and must show a pending economic crisis. Grants are determined based on the actual number of jobs saved and created. For this particular application, only the jobs directly generated by AID that pay at least $10 per hour would apply. Once the number of jobs is determined and proved, it is simply a matter of requesting the funds. AID can expect to qualify for approximately $50,000

under this program as a result of the jobs that could be restored from the completion of the wastewater reclamation project.

AID submitted a preliminary application for the CALFED Watershed Program grant on February 1, 2002. A response from CALFED, as to the project's funding potential, is not expected until mid-March. Due to the limited total funding available under this program, the requested amount was limited to two million dollars. Approval is unknown pending the current review process. If approval were given under this program, the required amount of funding from the Water Use Efficiency Program would be reduced accordingly.

D.3. Benefit Summary and Breakdown

Quantifiable Benefits to Delano

As mentioned previously, Delano's current wastewater treatment facility is inadequate to handle future effluent production levels. It is currently designed to process 4.4 MGD. The expected population growth of Delano will increase the wastewater demand to 6.66 MGD by the year 2020. The City of Delano's current wastewater storage facilities include four unlined and two lined storage ponds. The six effluent storage ponds collectively store 1,450 acre-feet, which amounts to about 106 days of storage at the design flow of 4.4 MGD. In May of 1991, the City entered into a contract with a local agricultural producer whereby the City would sell excess wastewater to them. The contract does not require the farmer to take the effluent and, due to a recent cropping shift, the City could potentially lose a source for disposal of the wastewater. Even if this disposal option remained available, Delano would still be required to construct more storage ponds to account for its expected production of over 7,000 acre-feet per year by the year 2020. The total cost of the planned expansion is estimated at $21.9 million. Of that amount, $1.53 million is planned toward the construction of the new 400 acre-feet storage pond. The proposed wastewater reclamation project would eliminate the need for this portion of the plant expansion.

Additionally, since the proposed system consists of a gravity pipeline leaving Delano's treatment plant, it's construction would also allow the City to significantly reduce the cost of pumping treated wastewater into existing storage reservoirs. The savings would be partially offset by the additional power consumption required for the proposed wastewater lift station and therefore is not included as a benefit.

Quantifiable Benefits to Alpaugh

AID used 5.223 million kilowatt-hours (KwH) in 2001 to pump approximately 13,215 acre-feet of groundwater for District use. Over the 25-year analysis period of the project, Delano will supply, on average, 6,195 acre-feet of water per year, which will reduce AID's need for groundwater pumping by 46.9%. Hence, the proposed pipeline would reduce the energy demand of AID by 2.45 million KwH per year. At the current cost of electricity, $.09/ KwH, that would save the District approximately $220,000 a year -- a present value of $5.5 million dollars over 25 years. Although AID would initially benefit from the reduced electric bill, the savings would be passed on to the customers of the District, who would become the ultimate beneficiaries.

Of the 8,100 farmable acres within AID, only 3,900 acres are currently being cultivated. The increased cost of water associated with high power rates has and will likely lead to additional farmland being taken from production unless corrective measures are implemented. If production were increased to the full 6,600-acre prime farming areas, the gain in revenue to the Alpaugh economy would be $900 per acre per year, for a total of $2.43 million dollars per year. Further, an additional 1,500 acres that have remained fallow since the early 1970's could also return to production and yield $300 per acre per year for a total of $450,000 per year. The combined boost to the economy in gross agricultural sales alone would be about $2.88 million dollars per year. Accordingly, agricultural related jobs will also be preserved as a result of this project.

Quantifiable Benefits to CALFED

CALFED will gain, on average over the 25-year analysis period of the project, 6,195 acre-feet of water per year (154,875 acre-feet over 25 years) in the Southern San Joaquin watershed. As the City of Delano continues to grow, the amount of water supplied to

Alpaugh will increase and the need for groundwater pumping of AID will decrease proportionally.

Summary of Costs and Benefits

Benefits to Alpaugh	$5,500,000
Benefits to Delano	$1,533,000
Total Local Benefits	$7,033,000
Total Cost of Project	$4,999,862
Benefit - Cost Ratio	**1.41**

Non-Quantifiable Benefits to CALFED

The use of treated wastewater for irrigation has a significant, positive ecological impact. By reducing groundwater depletion in the southern central valley, more groundwater is available to support the Bay-Delta water supply and increase aquatic habitats. A project such as this one will stand as an example to other regions of California and encourage participating agency cooperation in the use of treated wastewater for irrigation, thereby having a considerable combined impact on the Bay-Delta water region. Secondly, this project reduces energy consumption. Any reduction in energy consumption, especially one with broad impact, reduces pollution and strengthens California's energy situation.

D.4. Assessment of Costs and Benefits

In order for this project to prove cost effective over the next 25 years, there must be continued cooperation between the City of Delano and AID. This is likely considering the symbiotic nature of their relationship. Delano desires to dispose of the water; Alpaugh desires the water for irrigation. That situation will not change as long as the population of Delano continues to grow and the farmers of Alpaugh continue to produce cotton and alfalfa.

Assumption One:

The population of Delano will generate, on average 6,195 acre-feet per year of wastewater over the next 25 years.

Current plans for expansion in Delano include a 5,080-bed prison, which will generate an additional 0.77 MGD. Initial occupancy for this facility is scheduled for the winter of 2003. The construction of the proposed project is October 2003. The benefits derived from this additional water source were not included since a formal agreement with the State has not been obtained. However, the State is very interested in the plan and, if successful, the additional flow will significantly enhance project benefits.

Assumption Two:

The farms of Alpaugh will continue to grow crops not intended for human consumption. Since Alpaugh sits on a high water table of brackish water, the soil maintains a high alkaline rating. This condition is difficult, if not impossible, to remedy, since the soil will not allow minerals to seep below the underlying Corcoran clay. Therefore, Alpaugh is not suited to growing fruits or vegetables and will continue to focus on these types of crops.

Assumption Three:

Due to the fact that the proposed system consists of a gravity pipeline leaving the treatment plant effluent pump station, the additional energy costs necessary for the proposed wastewater pump station are offset by the savings that the City of Delano will realize in pumping much less treated wastewater into its existing storage reservoirs. As stated above, only peak flows would be pumped and later drained into the proposed pipeline by an automated valve system. In reality, the hydraulic lift to AID's reservoir is less than the lift required at the plant and in combination with the fact that the pump station will be more efficient with the VFD system, the net energy requirements will be less.

Costs:

The costs of the project are primarily due to labor and materials associated with designing and installing a twelve-mile pipeline. Although the costs are significant, the benefits are commensurate and stable.

Table of Costs and Benefits

Project Beneficiary	Costs	Quantitative Benefits	Non- Quantitative Benefits
DWR/CALFED	$5.0 Million Dollars	-6,195 acre-feet /YR increased groundwater available to Bay-Delta over 25 years (154,875 acre-feet total)	-Working model of recycled water among different agencies for an example of agricultural efficient water use.
Delano		-Spared $1,533,000 for pond construction. -Gains reliable method of disposing of water.	
Alpaugh		-Electric bill reduced by 46.9% = $220,000 /yr over 25 years = $5,500,000 -Maintain/increase productivity of local agricultural industry	

E.1 Outreach, Community Involvement and Acceptance

Local Government Support for the Project

This project has received unparalleled support from all parties involved. The City Manager, Adela Gonzales, has instructed all groups involved to work cooperatively in the effort to design and construct the pipeline.

The Alpaugh Irrigation District has held several meetings to discuss the project. In January of 2002, AID sent a letter to Delano expressing inertest in the project and encouraging both agencies to work together to achieve a mutually beneficial goal. The project has the full support of AID and its growers.

The nearby Southern San Joaquin Municipal Utility District has also pledged support for the project. Bill Carlisle, the District General Manager, has contributed his knowledge and skills to AID in helping them to pursue this project.

The nearby Atwell Island Water District is also supportive of the project.

State and Federal Government Support for the Project

This project has gained the support of 30th District State Assemblyman Dean Florez, 31st District Assemblymember Sarah Reyes, the California Department of Corrections, and State Senator Jim Costa. Also, the Regional Water Quality Control Board, as determined in preliminary discussions, has embraced the project. Please refer to the attached Letters of Endorsement in Appendix B.

Environmental Impact of the Project

Since the proposed pipeline route follows existing roads, highways, and railroads for the majority of its route, it is unlikely to have any negative environmental impact. Further, since the potable water of Alpaugh sits far below a layer of Corcoran clay, as discussed

earlier, treated wastewater on the surface will not seep through to contaminate potable groundwater. Therefore, it is expected that the project will be classified categorically exempt.

Jobs Created by the Project

The Alpaugh Irrigation District will be able to rehire two employees they were forced to lay-off due to the cost of maintaining their current operations. The proposed project will restore lost jobs, and likely generate more jobs for office staff and maintenance personnel. The design and construction of the proposed pipeline and appurtenances will create obvious job provisions during this time.

Summary

The Delano-Alpaugh Water Reclamation Project is a feasible solution to the problems faced by both the Alpaugh Irrigation District and the City of Delano. When viewed from a regional perspective, the project is an obvious means of accomplishing a variety of goals. Upon completion, the new system will serve as a positive example of natural resource management and inter-agency cooperation.

Appendix A: Resumes

Mark K. Dawson

CERTIFICATION

Civil Engineer, State of California, License # - RCE 44513

EDUCATION

1983-85 **California State University Fresno**
- Bachelor of Science Degree, Civil Engineering

1980-83 **Bakersfield Jr. College**
-Lower division Civil Engineering coursework

WORK HISTORY

Civil Engineer **Cornerstone Engineering, Inc.** Bakersfield, California *5/00 - Present*
Design of regional sewer and storm drain systems and master planning, grading plans, hydrology and hydraulics calculations, structures, pavements, grant application processing.

President and CEO **Inroads Engineering, Inc.** Bakersfield, California *4/00- Present*
Establishment and operation of the company and management of local assistance engineering services for agencies utilizing federal and state funding for transportation related projects.

Engineer 3 **Kern County Roads** Bakersfield, California *10/94 - 5/00*
Transportation advanced planning. Planning and coordination of federal and state aid transportation projects with various state and federal agencies. Managed various funding programs. Prepared annual DBE plan updates and various project agreements. Ensured compliance with federal and state program policies. Coordinated flood disaster repair activities and obtained reimbursement from FEMA , FHWA and OES. Supervised environmental and road design activities. Created and oversaw development of department wide project tracking database and automated contract payment system.

Engineer 3 **Kern County Transportation Management** Bakersfield, California *10/93 - 10/94*
Regional Transportation Plan and Federal Transportation Improvement Plan coordination and review. Oversaw review of development impacts on road system. Supervised an engineer and engineer assistant.

Engineer 2 **Kern County Transportation Management** Bakersfield, California *2/93 - 10/93*
Reviewed consultant traffic studies for development projects. Developed semi-automated traffic count book reporting spreadsheet program.

Civil Engineer 2 **Kern County Public Works** Bakersfield, California *3/89 - 2/93*
Construction resident engineer ensuring compliance with plans and specifications for various public works contracts and subdivision/permit construction projects. Preparation of job diaries, contract change orders, pay estimates and various other reports.

Civil Engineer 2 **Kern County Public Works** Bakersfield, California *8/87 - 3/89*
Drainage division supervisor. Drainage project planning, design, and maintenance. Supervised two draftsmen.

Civil Engineer 1, 2 **Kern County Public Works** Bakersfield, California *8/85 - 8/87*
Project engineer in drainage division. Designed plans and specifications for drainage projects including storm drains, sumps, pump station modifications, detention basin bypass systems. Hydrology/hydraulic and earthwork calculations, supervision of

MARK K. DAWSON, continued.

draftsmen in plan preparation. Assisted in project planning and prioritization and cost estimating. Performed drainage studies on existing drainage systems. Prepared RFP's and reviewed consultant drainage studies for agreement compliance.

Civil Engineer 1 **Kern County Public Works** Bakersfield, California *6/85 - 8/85*
Subdivision plan reviews relating to impacts on road system and compliance with County standards.

Engineer Aide **Coonley Engineering** Bakersfield, California *Summer 1984*
Grading plan design, sewer and water system study and design, surveying, drafting.

Engineer Aide2 **Kern County Public Works** Bakersfield, California *Summer 1983*
Classification and count surveys, speed studies, crosswalk study in traffic division.

Engineer Aide1 **Kern County Public Works** Bakersfield, California *Summer 1982*
Classification and count surveys, speed studies, culvert survey in traffic division.

Engineer Aide1 **Kern County Public Works** Bakersfield, California *Summer 1981*
Rear chainman on a survey crew.

PROFESSIONAL AFFILIATIONS

ASCE, Member

HONORS

Tau Beta Pi, National Engineering Honor Society

Arnold J. Whitaker

CERTIFICATION

Civil Engineer, State of California, License # - RCE 59320
Civil Engineer, State of Florida, License # - RCE 56680
Civil Engineer, State of Idaho, License # - RCE 9828
Civil Engineer, State of Washington, License # - 37238
Land-Surveyor-in-Training, State of California, License # ZL005561

EDUCATION

9/93 - 6/96 **California Polytechnic State University, San Luis Obispo**
- Bachelor of Science Degree, Civil Engineering

9/91 - 6/93 **California State University, Bakersfield**
- Major: Engineering

WORK HISTORY

Managing Engineer **Cornerstone Engineering, Inc.** Bakersfield, California *8/97 - Present*
- Manage all civil engineering design work and surveying operations for the firm.
- Serve as technical staff manager and job coordinator.
- Perform hydraulic/hydrologic calculations for commercial, residential, and municipal sites.
- Basic Structural/Seismic design of retaining walls and other exterior structures.
- Provide project site inspections as needed.
- Extensive interaction with clients and governing agencies.

Mining Engineer **Granite Rock Company,** Wilson Quarry - Aromas, California *6/96 - 8/97*
- Responsible for all design work and surveying associated with the mining plan of the A.R. Wilson Quarry.
- Perform all hydraulic/hydrologic design work and project management related to stormwater drainage and plant operations.
- Involved in the planning and design of blasting operations, pump systems, dust control systems, and quarry automation.
- Ensure compliance of all mining operations with local, state, and federal regulations.
- Serve as Quarry Supervisor (managing 14+ people at any one time).

Student Assistant Surveyor **Department of Water Resources,** State of California 7/94 - 4/96
- Member of Precise Surveys Party, San Joaquin Field Division.
- Participated in surveys to monitor movement along the State Water Project.
- Operated electronic distance measurement equipment (Wild DI-3000) and leveling equipment (Wild NA-3000).

PROFESSIONAL AFFILIATIONS

American Society of Civil Engineers, Member
Society of Mining Engineers (AIME, San Francisco Chapter)

HONORS

Dean's List (9 out of 14 quarters attended)
Chi Epsilon, National Civil Engineering Honor Society (Engineering Student Council)
Tau Beta Pi, National Engineering Honor Society
Golden Key, National Honor Society
National Deans List (1995)
Merit Scholar, Department of Arts and Sciences, C.S.U.B.

ARNOLD J. WHITAKER, continued

California Scholarship Federation Gold Seal Bearer

ACTIVITIES

Society of Mining Engineers (AIME, San Francisco Chapter)
Society of Civil Engineers
Backcountry Horsemen of California (Member and Internet Home Page Manager)
Church Youth Group Advisor

Michael J. Callagy

CERTIFICATION

Civil Engineer, State of California, License # - RCE 36214
State of Colorado, License # - RCE 30843
State of Arizona, License # - RCE 29212
State of Washington, License # - RCE 37150

Land Surveyor, State of California , License # - RLS 5556

EDUCATION

1981-84 **University of Southern California**
University of California, Los Angeles

1963-65 **Bakersfield Jr. College**
Major: Civil Engineering

1960-61 **Colorado State University**
Major: Civil Engineering

WORK HISTORY

President and CEO — **Cornerstone Engineering,** Bakersfield, California — *1979- Present*
- Operation of the company and management of engineering services. The company has employed up to 20 engineers, draftsmen, technicians and surveyors.

Engineering Manager — **Moreland Engineering,** Bakersfield, California — *5/76-11/79*
- Managed a staff of 6 draftsmen, 2 survey teams, and 1 engineer. Responsible for design and decisions relating to Civil Engineering functions. Hydrology, hydraulics, structures, pavements, sewer/water systems, calculations for mapping and surveying. Made decisions that are necessary to operate and engineering office. In charge of personnel decisions.

(Employment Outside Engineering Profession) — *1974-76*

Engineer (Field) — **Rickett, Reaves & Ward**, Bakersfield, California — *5/74-12/74*
Opened and operated a Branch office for this firm.
- Under my direction were from 2-6 Survey Crews and 1 Draftsman. Responsibilities included Supervision of Survey Crews and all calculations required.
- Field decisions concerning changes to plans and specifications and drainage facilities.

Assistant Project Engineer — **McIntire & Quiros,** Bakersfield, California — *4/70-5/72*
- Responsible charge of 8-10 Draftsmen, 2 to 3 Engineers and 2-4 Survey Crews
- Design and decisions relating to Civil Engineering functions. Hydrology, hydraulics, structures, pavements, sewer/water systems, calculations for mapping and surveying. In charge of personnel decisions and has responsible charge of operations.

Project Engineer — **Morrison Knudsen**- Boise, Idaho — *12/67-2/70*
- C.W. Wood & Sons - Los Angeles, California
- Gordon H. Ball - Danville, California

MICHAEL J. CALLAGY, continued

	- Construction Engineering, Project Operations, Cost control, Surveying, Design of Special Project Facilities and C.P.M.	
Engineer	**Lusich, Smith & Associates,** Bakersfield, California - Process and design subdivisions and general engineering projects. Hydrology, hydraulics, structures, pavements, sewer/water systems, calculations for mapping and surveying. Made decisions necessary to operate an Engineering Office.	*12/67-12/68*
Field Engineer	**Boyle Engineering**, Bakersfield, California - Responsibilities included: soil investigation, structure inspection, on site decisions involving general engineering concepts, interpretation of job plans and site adaption.	*4/66- 9/67*
Chainman Draftsman	**Don G. Simpson & Associates**, Bakersfield, CA - Worked on Survey Crews under different Chiefs of Party as Chainman and Instrument Man. Surveyed construction, route and section breakdown projects. - Drafted various Public Work Projects.	*8/65-9/66*

PROFESSIONAL AFFLIATIONS

CELSOC, Member/State Director
ASCE, Member
NSPE, Member
CSPE, Member
ITE, Member
APWA, Member/Director
FCCI, Member

Appendix B: Letters of Endorsement